

## Unit One - Lesson One

# Computer System Basics

### What is a Computer?

It is an electronic set which has the ability to store data and process them to reach certain results information.

### Some of Modern Computer Shapes



**laptop**

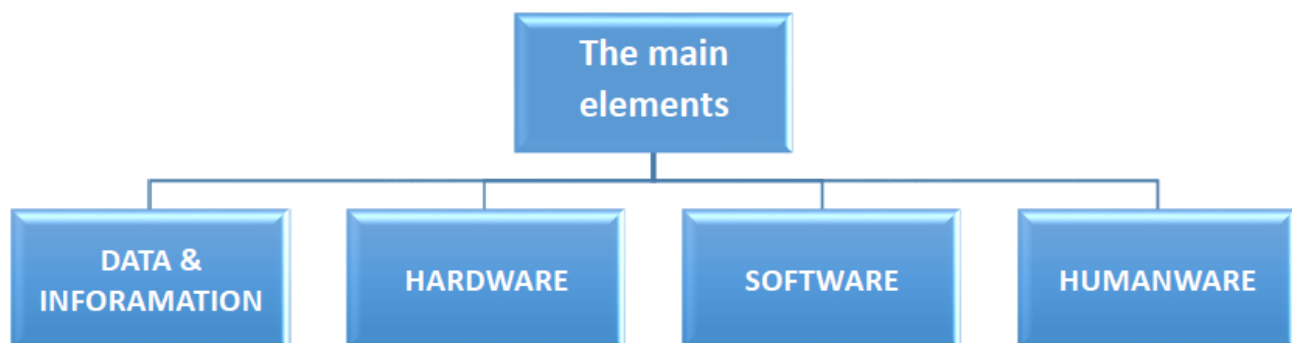


**Desktop**



**Smart Devices**

### The main Elements of computer system



## Data & Information

### Data:

They are set of facts that can be obtained by observation or watching. They are also the raw material of information.

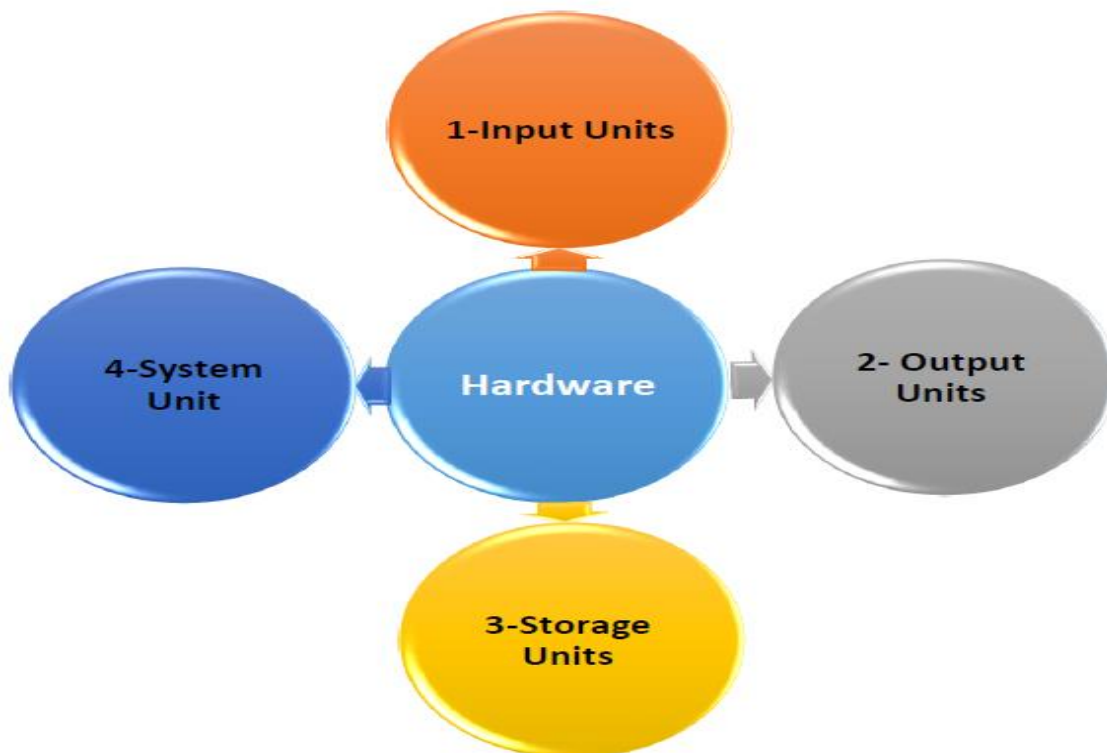
These data can be text, number, character, image, video, audio..etc .

### Information:

Data are processed by classifying, organizing and analyzing to have sense to achieve certain goal (objective). They may be in the form of reports, tables and charts.... etc.

## Hardware

Hardware is the actual content of the computer device which can be observed and touched. They include system unit, the screen, keyboard, the mouse..... etc. They can be divided into:





### 1. Input units:

The devices which are responsible for inputting different data into the computer.

### 2. Output units:

The devices which are responsible for outputting and displaying information.

**Tip**

There are some units that can be used to **input and output** together such as **Touch screen**.



### 3. Storage unit:

It is used to store data that can be retrieved (got back) at any time according to the user's need. The contents can't be lost when the electricity turns off.

### The most important storage units



Hard disc



Flash Memory

#### 4. System unit:

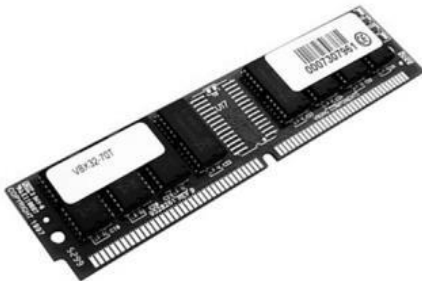
The most important components of the system unit:

1. The main memory unit
2. Processor (CPU)
3. Motherboard

**First : The main memory unit:** It is divided into :

##### RAM

- It is a random memory .
- It loses its contents when the electricity is disconnected or when the computer is shut down.
- It is the used part .



##### ROM

- It contains the main necessary programs for operating the device and is called (Bios).
- The producing company stores its contents so, the user can only read its contents only but it isn't possible to be overwritten .
- It is called a permanent memory because its contents never change even after the computer is shut down.



#### **Second: CPU (Central Processing Unit):**

- It represents the ( Processor ) .
- It is the most important part in the computer and is used for performing arithmetic or logic operations for processing data .

#### **Components of the ( Processor ) :**

- a- Arithmetic and Logic Unit ( ALU ) .
- b- Control Unit . (CU)



## Measuring units (The processor speed - storage capacity)

### 1) Storage capacity:

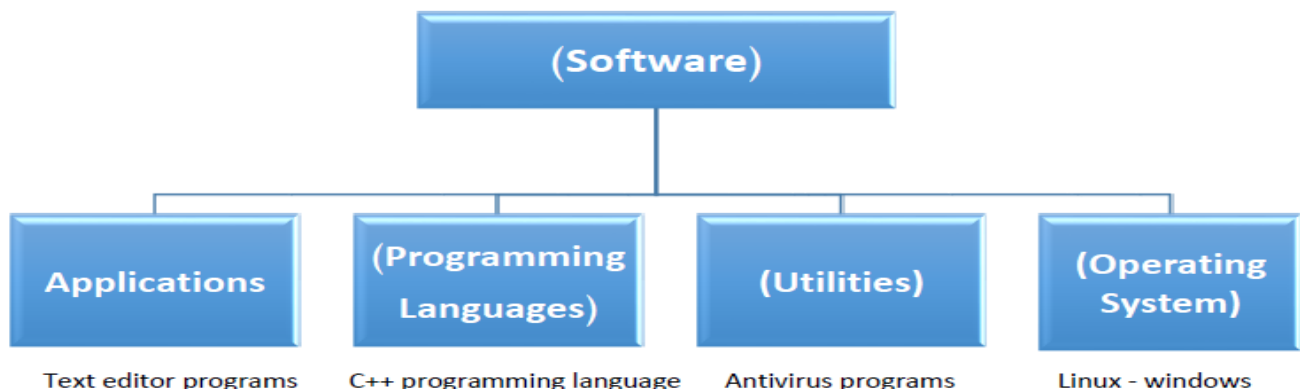
- **Byte :**  
can be used in most computer systems as a unit of measuring data. It is used to represent a letter or a symbol. It consists of 8 bits.
- **Bit:**  
represents passing or not passing the electric current. It takes the value of 0 or 1 as 1 represents passing the electric current (on) and 0 represents not passing the electric current (off).

1 Bit =	0 OR 1	1 Megabyte =	1024 Kilobyte
1 Byte =	8 Bits	1 Gigabyte =	1024 Megabyte
1 Kilobyte =	1024 Bytes	1 Terabyte =	1024 Gigabyte

### 2) The unit of measuring the processor speed:     Hertz (HZ)

#### Software

Software is a set of programs used to operate the computer and employ it to do different tasks.



## The comparison between open and closed source programs

### Closed Source Programs

A type of programs where you can't read its source code. It is only available for programmers or designers (The source code is the programming code of the program).



### Open Source Programs

They are the programs of source code available for use, editing, development and distribution.



Open source	Closed source
Available for free	Determine costs according to the usage license
The source code is available for all to modify and develop it	Developing the source code is done by the programmers of the owners only
Distributing programs to others without restriction is available	Not allowed for use but after getting the license.

## Humanware

مستخدم  
(User)

مبرمج  
(Programmer)

مصمم  
(Designer)

محلل نظم  
(Analyst)





## Unit One - Lesson Two

# Operating Systems

- Operating system is the most important kind of computer programs as there must be an operating system installed in the computer to be able to run the other types of different programs and applications and managing the Hardware of the computer.

### Operating system definition

It is a set of programs responsible for managing the hardware of the computer. On one hand it is a bridge between the user and his programs and the hardware on the other hand.

**Operating systems are responsible for managing:**

1. Computer hardware
2. Applications
3. Command prompt is where the user can prompt commands to operating system or through graphical user interface (GUI).

**The user can prompt commands in two ways**

**Command Prompt**

**Graphical user interface (GUI)**

**Command Prompt**

```
[moe@localhost ~]$ clear_
```

It is called "Terminal" in some operating systems where the user prompts commands to the operating system from command prompt using the keyboard.

**Graphical user interface (GUI)**

It contains some different commands and instructions in the form of menus, graphics , tool bars and the basic input unit is the mouse that makes computer more interesting.

## Characteristics of GUI

**It provides the user with graphic user interface which allows:**

1. Showing programs in the regular window frames.
2. Using simple drop down menu and tool bars.
3. The capability of operating several programs at the same time.
4. The capability of using Arabic and other languages as application interface.
5. Provide web browsers for web sites pages.

## Operating Systems (Open or closed Source)

### Closed source

1. **Mac OS X:** is an operating system specified for apple Mac devices that is attractive and easy to use.
2. **Windows:** One of the most famous operating systems and more common for personal computer.



### Open source

1. **Linux:** Open source operating system - easy to use and developable.

**It has several versions as :**

- a. Fedora  b. Ubuntu 

### **Mobile phones operating systems:**

- There are open and closed source operating systems for mobile phones.
- Operating systems and software applications are important factors especially when the technological specifications of mobile phones are approximated with each other.

### **Example:**

- **Android** is one of the open-operating systems.  
It is not only used in Mobile phones but also in tablets.





## Opening Screen of the Operating System

- In all the operating systems, when starting a computer, it starts checking the computers units or main devices and their security as ( Memory -Screen - Keyboard - ..... ) .
- A program performs this checking called ( Self-Checking Program ) which found in ( ROM ).
- By ensuring the safety of all the contents and that there are no malfunctions, the operating system starts working.

### The similarity among the main components of the starting screen in different opening systems are:

- **Background:**  
is a colour or image that can be changed by the user.
- **Icons:**  
are small symbols used in running different programs quickly as soon as you double click the left button of the mouse.
- **Bars:**  
are group of symbols of installed software on operating systems and others related to the important preparations of the system.  
such as: time and date setting and sound control and the network

#### **Tip**

The computer can contain more than one operating system but on starting, choose one of them to be loaded.

## Dealing with Files & Folders

### File:

is a set of data that is stored within the storage extensions and various media types, and user can handle either retrieve, modify, or delete them, or share them or print them.

File name consists of two parts Main name & extension and separated from each other by dot (.)

### The most file Types :

1. <u>Video files:</u>	Contain (sound clip, images) & we create it by recording video programs.
2. <u>Image files:</u>	we create it using painting programs & it has many extensions different according to accuracy, clarity and size of the image.
3. <u>Text files:</u>	There are a lot of programs that we use in writing texts such as (liber office – Ms office).
4. <u>System files:</u>	It is special for operating system and the devices connected to the computer that we shouldn't delete it because it will damage the operating system. Their extension such as: .exe & .bat

### Create & save file:

#### Create a file :

- Open one of the writing text programs.
- Write any text.

#### Save a file : (Ctrl+S)

- Open file menu.
- Choose save as then,
- Write the file name.
- Select where you want to save.
- Press save button.

### Folder Definition:

Folder contains files or sub-folders, the folder properties can be

identified by its size, the number of elements, the contents of files and folders, we can deal with folder by (Copy- Cut – Rename – Delete).

#### **Create a new folder :**

- Right click in the place where we want to create a new folder.
- Select new folder.
- Write the folder name.
- Press create.

**OR: Ctrl +Shift + N with Keyboard**

#### **Steps to copy or cut folder:**

- Right click on the folder.
- Select copy or cut.
- Move to other place.
- Right click there and select paste.

**OR: (Ctrl+C) for copy & (Ctrl+X) for cut & (Ctrl+V) for paste with Keyboard**

#### **Rename folder:**

- Right click on the folder.
- Choose Rename.
- Write the new name.
- Press Rename button.

#### **"Delete" file or folder:**

- Right click on the file Or folder
- Select "Delete"
- Press Ok

#### **Restore the deleted files or folders:**

- Go to recycle bin
- Right click on the file
- Select "Restore"

#### **Delete the file completely:**

- Go to recycle bin
- Right click on the file
- Select "Delete"

**OR:**

- Right click on recycle Bin

- Choose "Empty recycle Bin"
- Select Ok

# Computer Networks

## Computer network definition:

Is to connect two or more devices through a mediator wired or wireless to participate in the data (files&folders) and devices (printer&scanner).

## Types of computer networks:

- Local Area Network (LAN)
- Wide Area Network (WAN)

## Local Area Network (LAN):

Network is limited space inside a building or several neighbor buildings and used in small businesses, schools, universities or inside the house.

## Wide Area Network (WAN):

Used to connect devices that are separated by a great distances, such as cities or countries, and **the Internet** consider a special type of WAN.

## File sharing:

Sharing files is the process of sharing stored information, such as programs, documents and hardware components such as a printer between network devices.

## Share files in the Windows operating system:

- Select the file or folder
- Select share with
- Select specific people (dialogue box appears)
- Select people to share with
- Select "permission level" (to read or write file).
- Click " Share"

## To know your computer name:

- Right Click on my computer icon
- Select properties

## Unit Two - GIMP

### Lesson 1:

## Creating and Modifying Images

### The program of creating and modifying images:

It is a program used to design, create and modify different images, photos and drawings

### The programs types:

1. Closed source programs. (Adobe Photoshop)
2. open source programs (GIMP)



### GIMP:

It is an open and free source program that allows creating and processing images.

### GIMP interface forms:

1. Multi-window mode.
2. Single window mode.

### Change the interface to Single window mode:

1. Windows menu
2. Select Single-Window Mode

### GIMP Help:

1. Click on **F1** to show the program Help
2. **Move** the mouse pointer on the tool → The **tooltip** related to it will be shown as well as its shortcut key

### Restore Closing Boxes or Tabs:

1. "Windows" menu
2. Select "Recently Closed Docks"



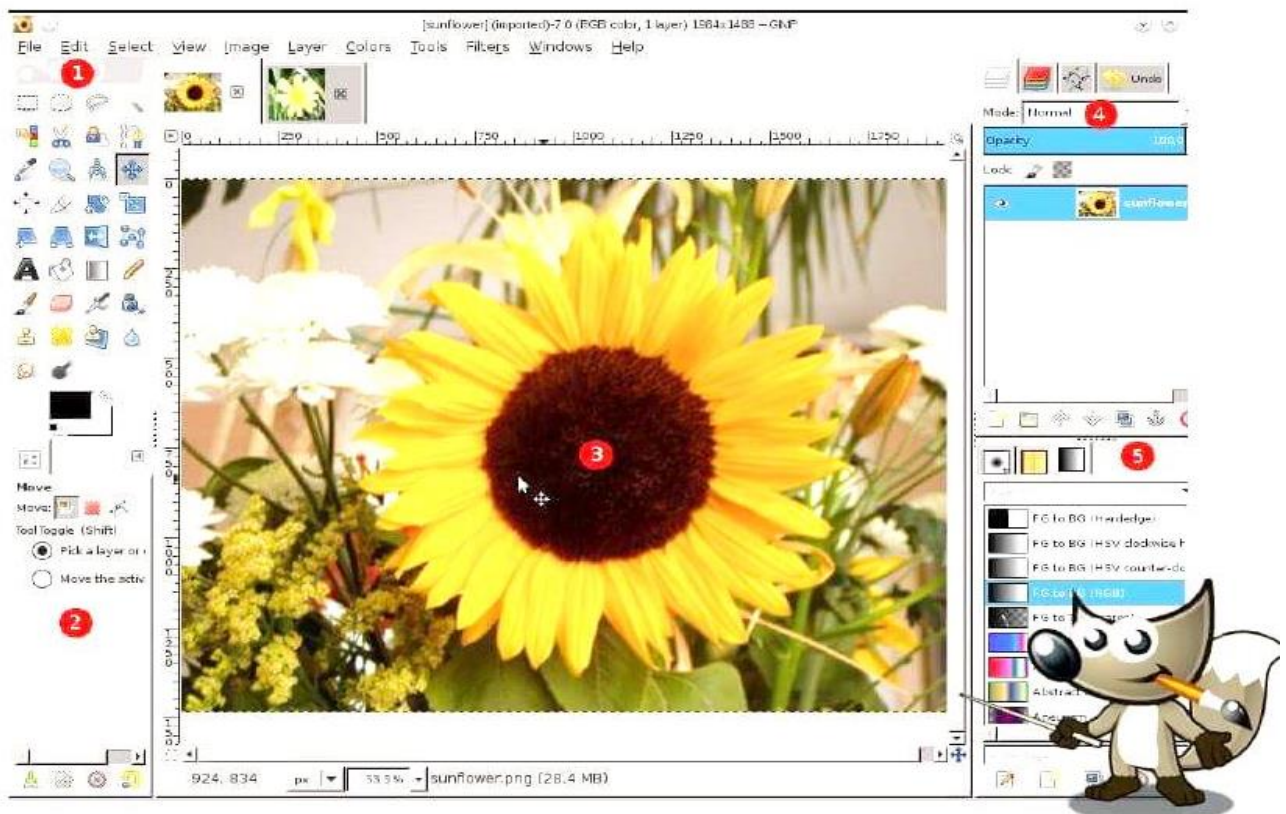




### Note

To add, close or move one of the tabs in the box, click on the top right corner to open a drop-down menu and choose the required one.

## GIMP Interface consists of:



1. **The Main Toolbox** : Consists of many tools such as the selection tools, back and front color tools
2. **The Tool options dock**: Shows the options of the current (selected) tool
3. **Image windows**: When opening more than one image, each image appears in a window which you can navigate between them
4. **(Layers/Channels/paths/Undo) dock**: It contains several classifications, such as the Layers tab.
5. **(Brushes/Patterns/Gradients) dock**: It contains the classification of Brushes, Forms tab, Gradients color schemes tab.



## The selection tools:






It is used to select a part or more of the image to delete, cut, copy, paste, change the color of the selected part in order not to change the whole image.

### Access to selection tools:

- 1- Tools Menu → select **Selection Tools**
- OR
- 2- The Main Toolbox → select **Selection Tools**



### Selection tools are:

- 1- Rectangle selection Tool   
Used to select a rectangle shape of the image
- 2- Ellipse Selection Tool   
Used to select the oval shape of the image
- 3- Lasso free selection Tool   
It is used to select an irregular part of the image in a freeway.
- 4- Fuzzy (Magic Wand) tool   
Used to specify similar color schemes areas of the image.
- 5- Smart Scissors Selection tool   
Used to specify an area distinguished with a clear and strong color where the colors of the borders are changed in a clear manner.



#### Note:

To finish the selection and exit

Press **Shift + CTRL + A**

Or

Select menu → select none

## Lesson2:

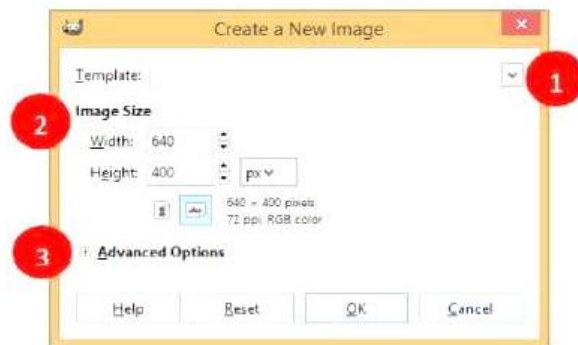
### Designing and Creating New Images

#### Create a new image file:

- File menu → new

#### New image dialogue consists of:

- 1- Template: it is a ready-made design previously prepared of the dimensions and the resolution of the picture.
- 2- Image Size: To identify the dimensions of the new image (length and width) click on the arrows.
- 3- Advanced Options: by clicking on + sign The rest of the dialogue box appears
- 4- X resolution and Y resolution: This is used to determine the image resolution when printing (and it does not affect the picture dimension)
- 5- Color Space: This is used to determine the Image color system RGB using red, green and blue colors or that of the gray scale using black and white colors and the gradients of grey between them.
- 6- Fill with: specify the new image Filling color which can be:
  - Background Color
  - Foreground Color
  - White filling
  - Transparency.



#### Add a stroke (border) to a selection:

Edit menu → choose "Stroke Selection"

#### Change a stroke (border) width:

Select "Line width" from Line width dialog box then Click on "Stroke"

#### Fill selection with color:

Edit menu → fill with FG Color or Bucket Fill tool  From Toolbox

#### Save Image:

File menu → Save



#### GIMP Image Extension

The GIMP program offers the extension .XCF to save image file  
This extension is useful in case of reopening modifying Image.



### Lesson 3:

## Paint tools

### Paint Tools:

Used to free hand drawing

### Access to paint tools:

1- Tools menu → paint tools

Or

2- Tools box → paint tools



### Pencil tool:

Is used for free hand drawing

### Pencil tool options:

You can change pencil tool options from

**Tools options → pencil tool**

Pencil options such as **Shape and size of the Brush**

### Blend Tool:

It is used to make color gradation using the front or back colors.

### Clone Tool:

It used to copy part of the picture in another place (in the same image layer). It is used to modify and reform the images

### Ink tool:

It used to control drawing distinguished borders and edges with the brush

### Paint brush tool :

It used to draw clearly

### Smudge Tool:

It used to mix the current color with the surrounding colors in the area of moving the tool by clicking and pulling the tool in the picture.

The cursor shape changes to   
When you press **CTRL**

Use **CTRL** to copy an area

### Eraser tool :

It used to remove a coloring Space of a picture or a drawing

## Lesson 4:

# Transforming and Resizing Tools

## Transform tools:

Used to change the image format by transforming, resizing, changing the image dimensions

## Access to Transform Tools:

You can access to transform tools by select

- 1- Tools menu → Transform Tools
- 2- Tools box → Transform Tools

## Move tool:

used for moving the image or the layers of an image to frame or text.

To move the selection, press **ALT + CTRL**

## Crop Tool:

Used to cut a part of the image

## Rotate Tool:

Used to rotate an image

## Flip Tool:

Used to flip horizontally or vertically an image.

## Scale Tool:

used to change the dimensions of an image [length and width]

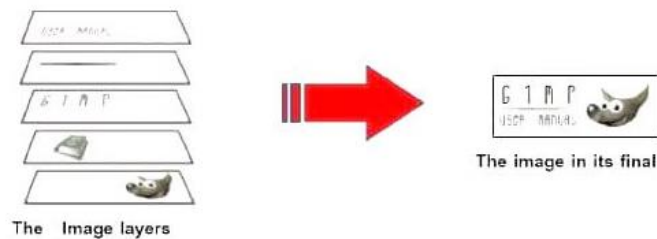


## Lesson 5:

### Image layers

#### Layers:

used to assist in the development of components and details different picture without affecting the rest of the image parts

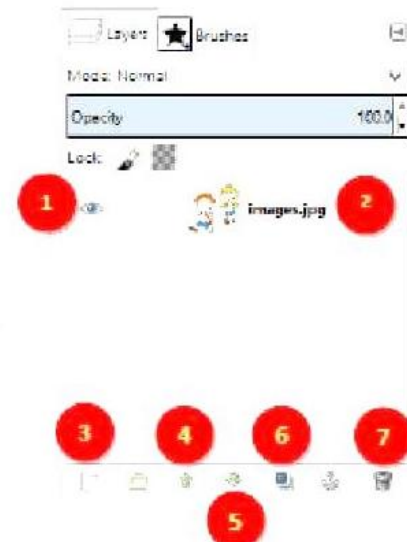


#### open the Layers Tab:

- Window menu → Dockable Dialogs → layers
- Or
- Layers Tab in the main interface of the program

#### Layers tab consists of:

- 1- **Layer visibility** to make the layer visible Or invisible.
- 2- **Layer thumbnail** a mini format of the layer and The layer name appears next to it
- 3- **New layer** to add a new layer
- 4- **Raise layer** to move the layer to the highest level.
- 5- **Lower layer** to move the layer to a lower level.
- 6- **Duplicate layer** to copy the current layer.
- 7- **Delete layer** to delete the current layer.



#### Rename the layer:

Double click on the layer and give it a new name.

### To make the image liable to delete part of It:

Select Layers menu → Transparency → Add Alpha Channel

### Invert the selection:

From select menu → Invert

### Export image to a file : ( JPG , GIF )

File menu → Export → select appropriate extension (JPG , GIF)

### Merging all layers: (to become one layer)

choose **Flatten Image** from the **Image menu**.

### Filter:

used to help change the appearance of an image.



#### **Remember**

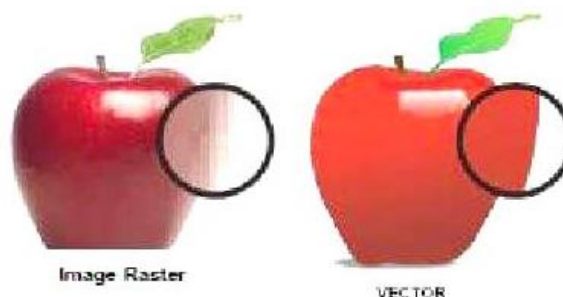
When applying the filter, a new layer is added to the image or a new file is created.

## Lesson 6:

### Image types

#### Image types:

- 1- Raster Images.
- 2- Vector Images



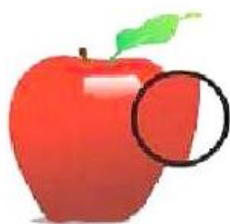
#### Raster Images:

- It consists of **contiguous points** (Pixels), and each image contains rows and columns of the Pixels
- The **higher** the number of the **Pixels**, the **greater** image **clarity** is
- It **has a large storage** area for the image
- The **quality** and clarity of the picture **change when zooming** in or out.

#### Vector Images:

- no change in image quality and clarity when enlarged or minimized,
- Has a small storage area.

#### Image Mode:



1- RGB mode.



2- Gray scale mode.



3- Indexed mode.

#### The color mode for image:

Image menu → Mode

#### RGB mode:

- RGB color mode used for **displaying images** and graphics **through** the computer screen.
- RGB mode consists of the primary colors (**red, green, Blue**)
- **These three colors** mixed with different degrees of mitigation, lighting and intensity to **give 256 color degrees**.

### Gray scale mode:

To change image to Gray scale by Selecting

**Image menu → mode → Gray scale**

- **Gray scale** mode reaches up to **256 degrees** of gray ranging from black to white.

### Indexed mode:

You can convert the image to Indexed mode by

Using **Indexed** from **Image menu**

#### Remember :

You can:

- **Select all** by choosing **Select Menu → Select All.**
- **Paste as New layer** by choosing **Edit menu → Paste as → New Layer**
- **Copy** by choosing **Edit menu → Copy**
- **Paste** by choosing **Edit menu → Paste**
- **Cut** by choosing **Edit menu → Cut**
- **Remove the selection** choose **Select Menu → None.**



**In order for other programs to be able to read the image file, the image must be exported as (JPEG -GIF - PNG.)**

## The most Important definitions

### Computer:

is an electronic set which input data and process them to output information.

### Data:

They are the raw material of information. (letter, number, video, audio and image)

### Information:

The result of processing data. (report, table and chart)

### Hardware:

Hardware is the actual parts of computer which can be observed and touched.

### Input units:

are devices of computer which responsible of input data to computer.

### Output units:

are devices of computer which responsible of output information from computer.

### Software:

Software is a set of programs used to operate the computer and do different tasks.

### Operating system:

Is a set of programs responsible for managing the hardware of the computer.  
And it is a bridge between the user and his programs and the hardware.

### Command prompt:

It allows user to input commands to operating system with Keyboard.

### Graphical User Interface (GUI):

It contains some different commands in the form of menus, graphics , tool bars and the basic input unit is Mouse.

### File:

Is a set of data which is stored in storage units in different kinds and extensions.

### Folder:

It is a place inside a storage device which contains a file or more and sub-folders.

### Network:

It's connection between two or more devices to participate in the data (files&folders) and devices (printer&scanner)

### Sharing file:

It is the process of sharing stored information, such as programs, documents and hardware.

#### 1. Show the difference between: RAM – ROM

Answer:

RAM	ROM
(Random Access Memory)	(Read Only Memory)
The user can read & write its contents	The user can only read its contents
It loses its data, when the computer turned off.	It doesn't lose its data, when the computer turned off.
Can adjust the size of the memory.	It contains the main necessary programs for operating the device and is called (Bios).

#### 2. Show the difference between: Open source – Closed source

Answer:

Open source	Closed source
The source code of the program is available for all to modify and develop it.	The source code of the program is available to modify and develop <u>only</u> for the programmers of the owners.
Available for free.	Set costs according to the usage license of the program. تحدد التكلفة طبقاً لترخيص الاستخدام للبرنامج
<u>Examples:</u> GIMP, Open Shot, Scratch, Libre office, Linux, Fedora, Android.	<u>Examples:</u> Microsoft office, Photoshop, Windows, Mac OS x.



### 3. Show the difference between: Save - Save as

**Answer:**

Save	Save as
Use to save a file at the first time.	Use to save a file at the first time.
Use to save file after modification with its same name, place and extension.	Use to save file after modification with different extension, name or place.


### 4. Show the difference between: Data - Information

**Answer:**

Data	Information
They are the raw material of information	The result of processing data.
<b><u>Data types such as:</u></b> Numbers, letters, image, video, audio.	<b><u>Information types such as:</u></b> Reports, tables and charts

## 5. Show the difference between: File - Folder

**Answer:**

File	Folder
Is a set of data which is stored in storage units in different kinds and extensions.	It is a place inside a storage device which contains a file or more and also other folders called sub-folder.
File name consists of two parts, <b><u>the first</u></b> is the name of file and <b><u>the second</u></b> is called extension.	To create a new folder press 
The file name is separated from its extension with a (dot).	
The user can deal with it on restoring, modifying, deleting, sharing and printing.	The user can deal with it on restoring, deleting, copying, cutting and pasting.
<b><u>File types:</u></b> Video files, text files, image files and system files.	folder properties is to identify its size and the number of its contents (files and subfolders)

## 6. Show the difference between: LAN - WAN

**Answer:**

LAN	WAN
Local Area Network	Wide Area Network
Used to connect devices that are connect at limited space inside a building or some buildings.	Used to connect devices that are connect at a great distance, such as cities or countries.
Used in small businesses, schools, or inside the house.	<b><u>The Internet</u></b> consider a special type of WAN.

*With My Best Wishes...*